



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,201	07/08/2003	Chi Fai Liu	3409-129	9686
22204	7590	01/08/2007		
NIXON PEABODY, LLP 401 9TH STREET, NW SUITE 900 WASHINGTON, DC 20004-2128			EXAMINER ALMO, KHAREEM E	
			ART UNIT	PAPER NUMBER
			2816	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/616,201	LIU, CHI FAI	
	<b>Examiner</b>	<b>Art Unit</b>	
	Khareem E. Almo	2816	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-10 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/8/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The amendment filed on 10/3/2006 has been received and entered in the case.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by applicant's own admitted prior art.

With respect to claim 1, Figure 1 of applicants own admitted prior art discloses a sawtooth generator for generating a sawtooth waveform as a function of a periodic pulse (30) coupled to said generator, comprising: a first capacitor (28) that is charged as a function of said periodic pulse and then discharged at a predetermined rate such that the voltage on said first capacitor defines said sawtooth waveform; and a reference circuit for limiting the peak voltage of said sawtooth waveform as a function of a predetermined reference voltage (29), said reference circuit including a zener diode (26) for generating said predetermined reference voltage in response to a predetermined bias current when said zener diode is reverse biased, a first circuit (32 36) coupled between said zener diode and said first capacitor and operative to limit the peak voltage on said capacitor as a function of said predetermined voltage, and a second circuit (32) for providing said predetermined bias current as a function of said periodic pulse such

that said predetermined bias current is turned on during the time said first capacitor is being charged and off for a substantial amount of the time when said first capacitor is discharging.

With respect to claim 2, Figure 1 of applicants own admitted prior art discloses a sawtooth generator of claim 1, wherein said periodic pulse is generated by a zero crossing detector (30) having two terminals to which an AC input is coupled, said detector for detecting each zero crossing of said AC input and generating said periodic pulse for each said zero crossing.

With respect to claim 3, Figure 1 of applicants own admitted prior art discloses a sawtooth generator of claim 1, wherein said second circuit comprises: a first transistor (22) having a base, an emitter coupled to ground, and a collector; said zener diode (26) having an anode and a cathode; said collector coupled to said anode of said zener diode at a first node; said periodic pulse being coupled to said base through a first resistor (20) such that said first transistor is switched on as a function of said periodic pulse, and a second (18), third (16), and fourth (44) resistor connected in series between a DC supply voltage ( $V_{cc}$ ), and said first node; wherein said predetermined bias current is provided to said zener diode as a function of said periodic pulse.

With respect to claim 6, Figure 1 of applicants own admitted prior art discloses sawtooth generator of claim 3, wherein said second circuit further comprises: a third capacitor (24) connected in parallel across said emitter and collector of said first transistor (22).

With respect to claim 7, Figure 1 of applicants own admitted prior art discloses

Art Unit: 2816

sawtooth generator of claim 1, further including a second transistor (32) having a base coupled to the junction of said second (18) and third resistor (16), an emitter connected to the junction of said third (16) and fourth (44) resistor, and a collector coupled to said first capacitor (28) through a fifth resistor (38).

With respect to claim 8, Figure 1 of applicants own admitted prior art discloses sawtooth generator of claim 1, further including a constant current source (48) for discharging said first capacitor (28).

With respect to claim 9, Figure 1 of applicants own admitted prior art discloses a sawtooth generator for generating a sawtooth waveform at an output terminal and including a first capacitor (28), a first circuit (22) for charging said first capacitor to a predetermined voltage as a function of an input pulse, a second circuit (48) for discharging said first capacitor at a controlled rate, and a third circuit (38) for generating a voltage at said output terminal as a function of the voltage across said first capacitor, a reference circuit for limiting the peak voltage on said first capacitor comprising: a zener diode (26) for generating a predetermined reference voltage in response to a predetermined bias current when said zener diode is reverse biased, a fourth circuit (34) coupled between said zener diode and said first capacitor and operative to limit the peak voltage on said capacitor as a function of said predetermined reference voltage; and a fifth circuit (32) for providing said predetermined bias current as a function of said periodic pulse such that said predetermined bias current is turned on during the time said first capacitor is being charged and off for a substantial amount of the time when said first capacitor is discharging.

With respect to claim 10, Figure 1 of applicants own admitted prior art discloses a reference circuit for providing a reference voltage during a predetermined time interval comprising: a zener diode (26) for providing said reference voltage in response to a predetermined bias current when said zener diode is reverse biased, and a bias control circuit (32) for generating said predetermined bias current only during said predetermined time interval such that said zener diode provides said reference voltage only during said predetermined time interval.

4. Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Anderson (US 3202937).

With respect to claim 10, Figure 3 of Anderson discloses a reference circuit for providing a reference voltage during a predetermined time interval comprising: a zener diode (40) for providing said reference voltage in response to a predetermined bias current when said zener diode is reverse biased, and a bias control circuit (36, 34, 26, 30, 24 and 22) for generating said predetermined bias current only during said predetermined time interval such that said zener diode provides said reference voltage only during said predetermined time interval (Note the predetermined time interval can be any range of time because it is not specified by the applicant. The discharge time of the capacitor indicates there is a predetermined time period in which the capacitor is discharging and providing the reference voltage. )

***Allowable Subject Matter***

5. Claims 4-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claim 4, the prior art fails to suggest or disclose the sawtooth generator wherein said first circuit comprises a first and second diode connected in series with said zener diode between the first node and said first capacitor at a second node as disclosed.

***Response to Arguments***

6. Applicant's arguments filed 10/3/2006 have been fully considered but they are not persuasive.

Applicant's argument that the predetermined reference voltage cannot be  $V_{cc}$  because the predetermined reference voltage is generated by the Zener diode is persuasive. However the predetermined reference voltage at node 29 can be the predetermined reference voltage since it is generated by the zener diode.

With respect to applicant's arguments the circuit in Fig 1 does not teach providing a predetermined current for the Zener diode as a function of a periodic pulse, such that the bias current is turned on during the time the capacitor is being charged and is turned



Art Unit: 2816

off for a substantial amount of the time when the capacitor is discharging and the current generated for the zener diode 26 is not a function of a periodic pulse, the Examiner disagrees. The bias current of a circuit (according to the Seventh Edition of Modern Dictionary of Electronics edited by Rudolf F. Graf) is the current through the base emitter junction of a transistor. It is adjusted to set the operating point of the transistor. In light of the specification, the bias current of the diode would be the current used to set the operating point of the diode. In the case of the bias current of the Zener diode it would be the current going through the zener diode (26). Assuming the bias current is the current between node 29 and ground (via 36), a periodic pulse is produced by the turning on and off of transistor 32. The current flowing through diode 34 is periodic due to the turning off and turning on of transistor 32. The current going through 26 is therefore a combination of the current from 36 and the current from diode 34. Depending on the voltage  $V_{cc}$  and the current going through 36 and the current going through 34 may be enough for the diode 26 to act in zener mode (i.e reversed biased) and thus set its operating point. The first capacitor (28) can only be charged when transistor 32 is on and is discharges when the transistor is off therefore reading on the claim language of 1.

With respect to applicant's arguments concerning claim 3, these arguments are not persuasive. According to Merriam Webster's Collegiate Dictionary (10<sup>th</sup> edition) the common meaning of couple (coupled or coupling) is to bring (two electric circuits) into close proximity as to permit mutual influence. In the current instant, because each and every circuit in the diagram of claim 3 influences each and every other circuit it can be



Art Unit: 2816

argued (using the broadest reasonable interpretation) that the anode of the Zener diode of Figure 1 is coupled to each and every other element in the circuit. Therefore, by definition, a coupling via ground can provide signal coupling as understood by one of ordinary skill in the art according to the ordinary definition (i.e. common definition) in the art and in general use.

With respect to applicants arguments concerning claim 10, the predetermined time interval can be any range of time because the applicant does not specify it. In the Anderson reference the predetermined interval is the range of all time (set by the user of the circuit) because the control circuit is constantly on. (i.e. if the operator decides to turn on the circuit for 15 minutes, it is determined in advance that the circuit will be on for 15 minutes. Therefore the time is predetermined.) Therefore the circuit is capable of functioning as claimed in claim 10 and remains anticipated by Anderson.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2816

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khareem E. Almo whose telephone number is (571) 272-5524. The examiner can normally be reached on Mon-Fri (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan can be reached on (571) 272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KEA

12/21/2006



Quan Tra  
Primary Examiner